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# NTISR: MAKING THE MOST OF AIRBORNE ASSETS

by

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A Research Report Submitted to the Faculty

In Partial Fulfillment of the Graduation Requirements

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April 2012

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Desperate times call for desperate measures, which is exactly what happened when the 2011 Budget Control Authority (BCA) mandated $487 billion in cuts across the Department of Defense (DoD) over the next ten years.[1] The desperate measures call for an equally massive audit of strategy, force structure, readiness and modernization across all services.[2] Though at a 60 year low in personnel strength, the Air Force plans to trade size for quality in an effort to become a more agile and responsive force.[3] Part of this trade requires a migration from traditional niche platforms to ones that support multi-role capabilities. Fortunately, the Air Force has an excellent case study it can use to truly attain these goals: non-traditional intelligence, surveillance and reconnaissance (NTISR). NTISR is a combat-proven capability that epitomizes agility and flexibility. For the last decade strike aircraft adapted to meet the increasing demands placed on niche ISR aircraft, modifying their tactics to fill increasing gaps in ISR capacity. Unfortunately, NTISR is far from perfect because it employs relatively narrow capabilities, the data gathered is fleeting and it suffers from organizational and ownership issues that only hinder its usage. In order to become more flexible and agile and migrate from niche to true multi-role capabilities, the Air Force must learn from and address these issues with NTISR. Despite its flaws, NTISR is an overlooked and frequently untapped capability that could change future operations across nearly every flying platform.

As a case study, NTISR forces the Air Force to reevaluate its ability to prepare for the next conflict, especially considering the acquisition of new platforms and capabilities.[4] In general, the military has a poor historical record when it comes to predicting who the adversary will be, what it is we will fight about and even when and where the conflict will occur. This is especially important when investing large sums of money in technologies designed specifically with these anticipated conflicts in mind. Because the Air Force cannot realistically predict the

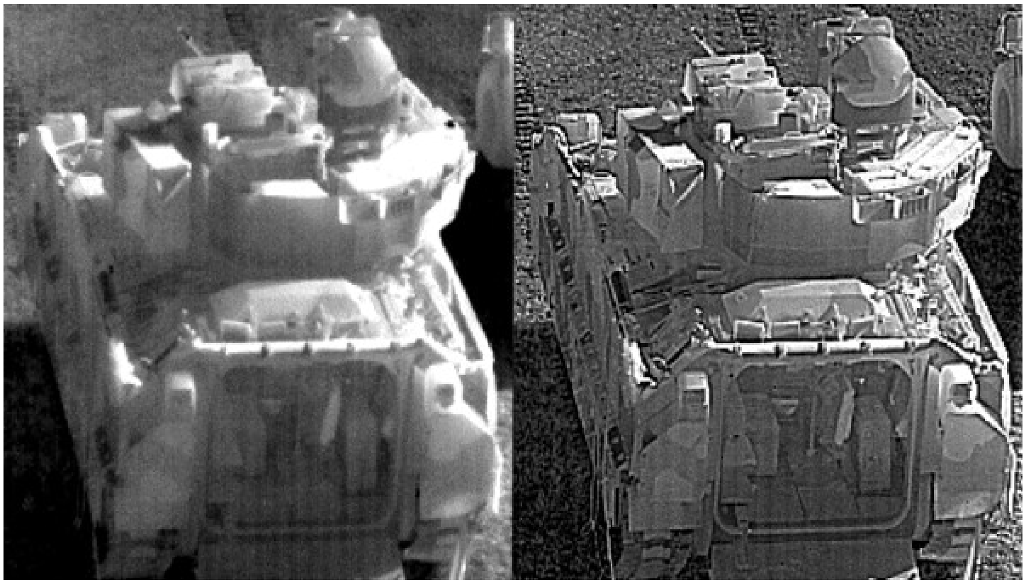
future, it behooves its leaders to plan for a certain amount of flexibility and multi-role capability with respect to their invested platforms and associated capabilities. NTISR is a gap-fill, yet multi-role capability, using platforms not traditionally designed for ISR to service shortfalls in sensor coverage. However, the inherent flexible nature of NTISR should open Air Force leader's eyes to a realm of future possibilities beyond specific platforms and their specific capabilities. The Air Force has an opportunity to capitalize on lessons learned from NTISR, and it should not wait until the next conflict erupts to begin implementing it.

NTISR is priority number six on the Secretary of the Air Force's (SECAF) ISR review task list.[5] The goal of the task list is to address the full-spectrum potential for tactical NTISR capabilities by platform and to include potential "realm of possible" candidates.[6] Realm of possible includes capabilities not currently in production. While the office of primary responsibility (OPR) is Air Combat Command (ACC), this task supports several other major Air Force commands.[7] The lead organization tasked to develop the NTISR roadmap is AF/A2 (intelligence), not AF/A3 (operations) or a combination of the two. Their challenge is to develop a roadmap that includes potential platform and sensor mixes, requirements for communication pathways, personnel training requirements and a concept of operations (CONOPs) development.[8] This tremendous undertaking is of paramount importance if the Air Force is to truly fulfill its goal of becoming a more agile and responsive force, especially in these fiscally-constrained times.

Although NTISR is not a new concept to military operations, it formally evolved to fill an operational gap that existed in Operation IRAQI FREEDOM (OIF) between the available and required ISR capability to hunt Scuds.[9] Because of the low-density/high-demand (LD/HD) nature of traditional ISR platforms, ad hoc means were implemented to provide a gap-fill

capability. Various sensors on different aircraft were employed to hunt the mobile Scuds, from electro-optical/infrared (EO/IR) targeting pods on fighter aircraft to ground moving target indicator (GMTI) and synthetic aperture radar (SAR) systems on the F-15E and B-1 bomber.[10] Scud hunting was a difficult mission and one that had limited effectiveness, but it did prove that traditional niche air assets could successfully flex to support non-traditional ISR roles.[11]

When hostilities kicked off in 2001, there were multiple targeting pods available that provided varying qualities of EO/IR data to the relatively new NTISR capability. These ranged from the first generation forward-looking infrared (FLIR) low-altitude navigation and targeting infrared for night (LANTIRN) pod and LITENING AT (advanced targeting) pod. LANTIRN utilized first generation technology originally developed in the 1980s.[12] Though LITENING was newer technology from 1999, the capability was initially only available on Air National Guard (ANG) and Air Force Reserve Command (AFRC) aircraft.[13] The pod was eventually distributed to a wider range of systems and users, such as the B-52 and AV-8B as well as the Royal Australian Air Force and Israeli Air Force, to name a few.[14] In 2002 some Active and Guard strike aircraft were upgraded to employ the third generation Sniper XR (extended range) advanced targeting pod (ATP) for support of Operation ENDURING FREEDOM (OEF) and eventually Operation IRAQI FREEDOM (OIF). Not only was the picture quality better with the Sniper XR, but the quality of data derived was much better, such as accuracy of coordinates.[15] However, all of these capabilities were still locked into a very specific piece of ISR.



**Comparison of first generation FLIR versus third generation FLIR images.[16]**

As an ad hoc capability, NTISR provides only a portion of the sensor coverage that traditional ISR aircraft achieve. This is a limitation of the sensors employed by the vast majority of aircraft that support NTISR, which are primarily via EO/IR pods. NTISR supports imagery intelligence (IMINT) when aircraft employ any sort of EO/IR pod such as LITENING or Sniper.[17] While other aircraft such as the B-1 and F-15E can employ GMTI or SAR capabilities to support ground operations via onboard systems, the majority of joint tactical air requests (JTARs) submitted by ground units are for some sort of EO/IR sensor.[18] The emphasis on an EO/IR capability is based on a growing need for non-kinetic reconnaissance and surveillance support, a capability that current counterinsurgency (COIN) operations demand. This leans very heavily on the EO/IR capability that the various EO/IR sensors provide.

Though these EO/IR pods are very capable sensors, they are still pigeonholed into support of IMINT. Their capabilities were designed primarily for ground targeting, but are now used for non-traditional purposes. For example, the IR marker on the Sniper XR has the capability to provide situational awareness (SA) to other aircraft as well as the ground

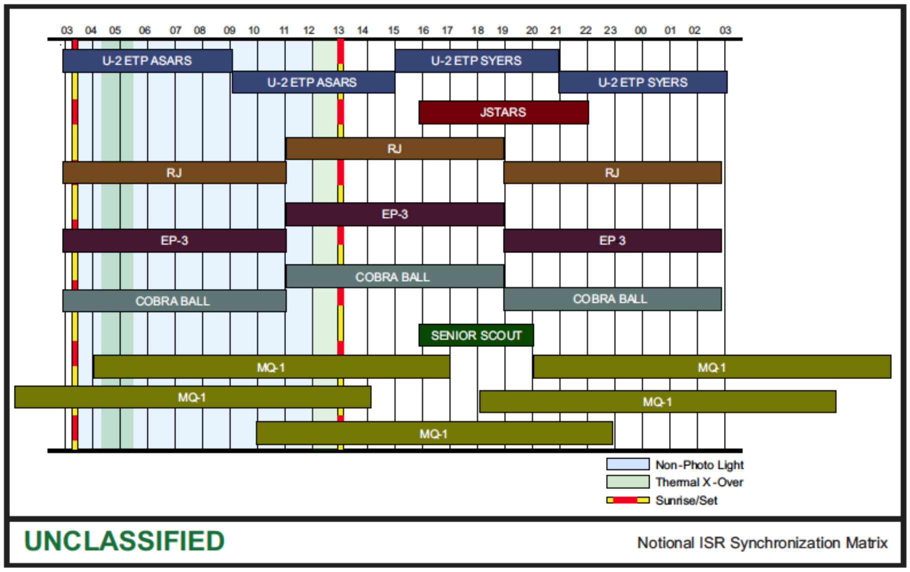
commander during night operations. Its on-board laser allows the aircraft to derive highly accurate coordinates not only for employment of ordnance, but to provide locations of various points of interest (POI) for the ground commander. Current tactics also allow aircraft to buddy lase, which involves one aircraft releasing a laser-guided munition while the other aircraft guides it in with the laser on its targeting pod. Integration with pods on other aircraft also occurs through a laser spot search (LSS) and laser spot track (LST) function, allowing one aircraft to essentially drag the other aircraft's pod onto a specific POI. Though originally designed for targeting, its unique capabilities provided built-in flexibility.

While most Air Force strike aircraft now employ the Sniper XR targeting pod with similar tactics, techniques and procedures (TTPs), their capabilities can differ. For most fighter aircraft, the Sniper XR is integrated with onboard avionics, providing quick and easy access of data derived from the pod. Some aircraft, such as the B-1 bomber, did not obtain that capability until recently. Even then, this capability was integrated through an onboard laptop computer (LCTP – laptop controlled targeting pod) and an additional track handle, which only added to the human factors problems. Because the pod is integrated with onboard aircraft systems, such as an inertial navigation system (INS), accuracies in coordinates derived from the sensor can vary significantly across various platforms.[19] Finally, loiter time of the platform and whether or not there are multiple aircraft (such as a two-ship of fighters), can influence employment and overall capability. Strike aircraft, though employing the same sensor, may bring different levels of effects they bring to the ground commander.

Because ground units often request effects-based capabilities, limitations are automatically placed on them if they require something outside of an EO/IR capability. This results from a combination of limited traditional ISR assets and the narrow capabilities NTISR

assets employ. Even if they only require full motion video (FMV) through a platform such as the MQ-9, their request still depends on where it falls on the priority list. The same is true for other types of intelligence. Though unsupportable via an EO/IR pod, electronic intelligence (ELINT) and communications intelligence (COMINT) are additional capabilities ground units routinely request for operations. Onboard systems, such as an aircraft's radio warning receiver (RWR), were not designed to support these types of requests, especially for support of COMINT. Therefore, the ground unit must gain access to a traditional ISR asset. If low on the priority list, the ground unit may try to piece together capabilities from different sensors on various aircraft in order to obtain some semblance of a complete picture. This could involve using an RC-135 for COMINT and a Sniper-equipped F-16 for pseudo-FMV. Unfortunately, this is hard to accomplish at the operational level because of problems with priority, availability of assets and the overall construct of NTISR itself.

As a capability, NTISR has the potential to provide unmatched agility and flexibility to the air and ground commander. However, this was not due to deliberate planning by the Air Force. Instead, the scramble to support LD/HD ISR assets with a gap-fill capability resulted in a new capability, NTISR. Unfortunately, little thought is given to true integration of NTISR because of some limitations of the capability in its current form.




**Notional ISR Synchronization Matrix. Displays lack of overlap for notional assets such as the RC-135 (RJ), EP-3, U-2 and COBRA BALL; no integration of NTISR.**[20]



Though there is an EO/IR capability, the pseudo-FMV that NTISR provides is not persistent. Most strike aircraft just do not have the loiter time of smaller remotely piloted aircraft (RPA). GMTI and SAR capabilities exist on aircraft such as the B-1 and F-15E, but these capabilities are of limited use to the ground commander for relatively short amounts of time, or unless weather negates use of an EO/IR capability. Plus, there is no consistent way to exploit that data once the aircraft returns from the mission. Therefore, narrowly defined capabilities result in limited use by ISR planners and the ground commander. This limits integration at the operational levels unless gaps exist that requires immediate attention based on priority, which usually happens in a dynamic, instead of planned fashion.

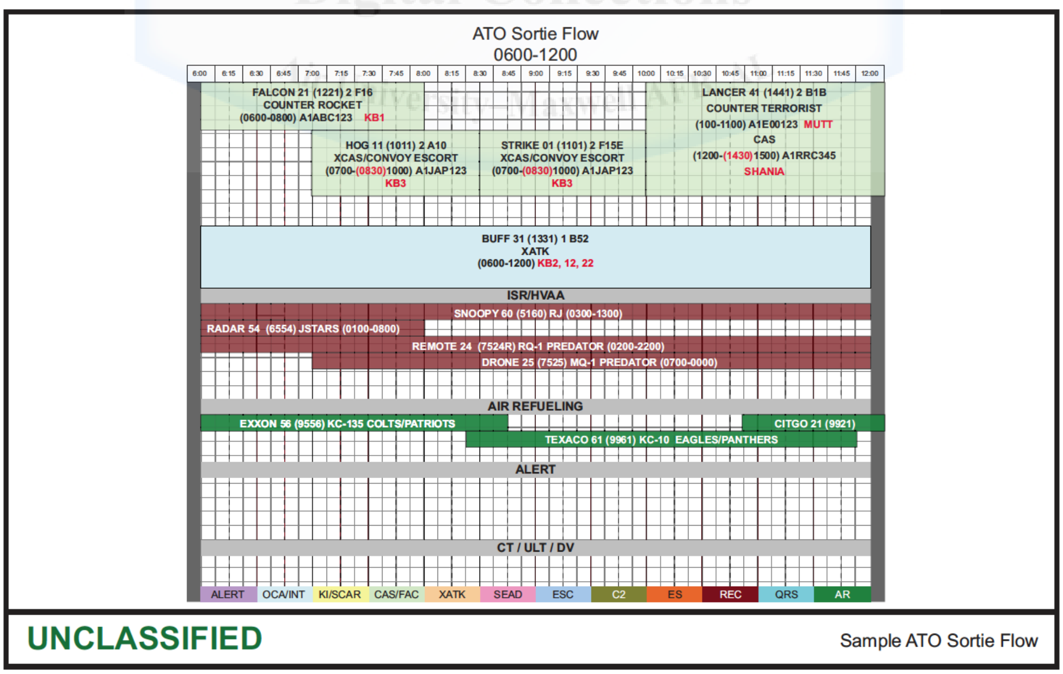
NTISR is more of a capability than a mission, which does not lend it easily to structured planning.[21] Close air support (CAS) and ISR are missions that are routinely planned for. As such, these missions get both apportionment and allocation of assets. Conversely, NTISR is a capability that strike aircraft normally execute within the confines of on-call CAS (XCAS).

Even then, NTISR is further divided into subsets commonly labeled as armed overwatch and armed surveillance.[22] Armed overwatch occurs when strike aircraft are in direct support of ground commanders, providing situational awareness for their specific scheme of maneuver, such as convoy escort.[23] Armed surveillance is a bit different, with strike aircraft providing real-time information during inactive periods on the ground.[24] Regardless of whether the strike aircraft executes the NTISR subset of armed overwatch or armed surveillance, it is usually labeled as XCAS on the air tasking order (ATO). This lack of formal processes resembles the current best practices recommended by the 12 March 2012 Air Force Tactics, Techniques, and Procedures (AFTTP) 3-3.AOC publication, which does not include deliberate planning for NTISR. Interestingly, this involves creating and posting an NTISR collection spreadsheet to the AOC webpage and emailing it to various flying units.[25] It is supposed to be updated for each ATO day and list assignments in priority order, providing a way to determine not only available assets for tasking, but also their proximity to supported ground units. This highlights how NTISR is a "just in case" capability, something that is not deliberately planned for yet has detrimental effects on the battlefield if not properly utilized.

NTISR is able to fills gaps in traditional ISR coverage when required, so long as assets are available. If assets are re-roled, it could potentially involve many players and processes within the air operations center (AOC). The senior intelligence duty officer (SIDO) is responsible for execution of ISR missions, and therefore has first-hand knowledge whether or not gaps exist in requested coverage. On the other hand, the senior operations duty officer (SODO) is responsible for execution of all strike missions, which often include XCAS. Though the majority of U.S. strike aircraft employ the Sniper XR or LITENING pods, coalition or other joint aircraft may not have this specific or similar capability. The liaison officer (LNO) could

also get involved if questions arise about specific capabilities. Though this is not particularly complex, it does involve multiple actors. Comparison of priorities must occur between intelligence and operations, which may result in ISR coverage gaps that do not get serviced. These processes at the operational level get cumbersome due to ownership issues. This forced ground units that do not get priority for ISR to circumnavigate the red tape in order to get the support they require.

The issue of ownership is something the NTISR capability needs to overcome to ensure true joint operations, even within the Air Force. Currently, most NTISR assets "belong" to operations, not intelligence. This is contrary to traditional ISR assets, which belong to intelligence and not operations. Pulling a strike asset from a mission such as XCAS to function in an NTISR capacity is usually not that difficult, mainly because XCAS is a capability placeholder for an aircraft that does not have an assigned JTAR.




**Sample ATO Sortie Flow showing planned XCAS/Convoy Escort sorties (likely NTISR candidates).[26]**

However, it becomes more difficult when that strike asset is supporting an equal or higher priority JTAR. If the strike asset is involved with a troops-in-contact (TIC) situation, that possibility is nil.[27] In any case, the strike asset must get cleared to transition from its primary assigned mission to pick up an alternate mission such as XCAS.

Similar to the JTAR for strike requests, requests for ISR emphasize the importance of specific required effects. Some of the ISR effects include SIGINT, GMTI, FMV and any combination of EO, IR and SAR.[28] A trained eye can already see that the request for these required effects already point each capability toward specific platforms. For instance, GMTI, unless it comes from an NTISR asset such as the B-1 or F-15E, is a capability that only the E-8 Joint Surveillance Target Attack Radar System (JSTARS) brings to the fight. Traditional FMV is a capability the MQ-1 and MQ-9 offers, yet a pseudo version is available with the platform employing the video downlink (VDL)-equipped Sniper XR.


**VDL-equipped Sniper XR/ATP[29]**

Additionally, EO, IR and SAR capabilities exist on the MQ-1, MQ-9 and U-2. While these requests help to narrow effects to specific ISR platforms, they do not take into account the capabilities of NTISR because assigning a strike asset to a primary mission of ISR is unheard of.

Very few, if any, of Operation ENDURING FREEDOM (OEF) combat sorties over the last decade were originally planned as NTISR.[30] That is because NTISR is really a capability executed within the confines of XCAS as either armed overwatch or armed surveillance.[31]

Ground units routinely request close air support (CAS) and then use the aircraft in a non-traditional role, such as scanning lines of communication (LOC) for improvised explosive devices (IEDs), convoy escort or tracking suspect individuals with a targeting pod. Sometimes ground units are not even outside the wire for these requests, viewing the aircraft's VDL feed through a remotely operated video enhanced receiver (ROVER) from inside of the tactical operations center (TOC), which is how armed surveillance came about. The combat strike aircraft effectively turns into an ISR platform for the supported ground unit, providing a type of pseudo-FMV through its VDL feed to the ROVER. This identifies how ground units figured out how to circumnavigate the red tape involved at the higher coordination levels, finding clever ways to get the desired effect they require while also preserving a decent kinetic option.[32] It is just the nature of the current beast, as LD/HD platforms are unable to fulfill 100% of requests for traditional ISR.

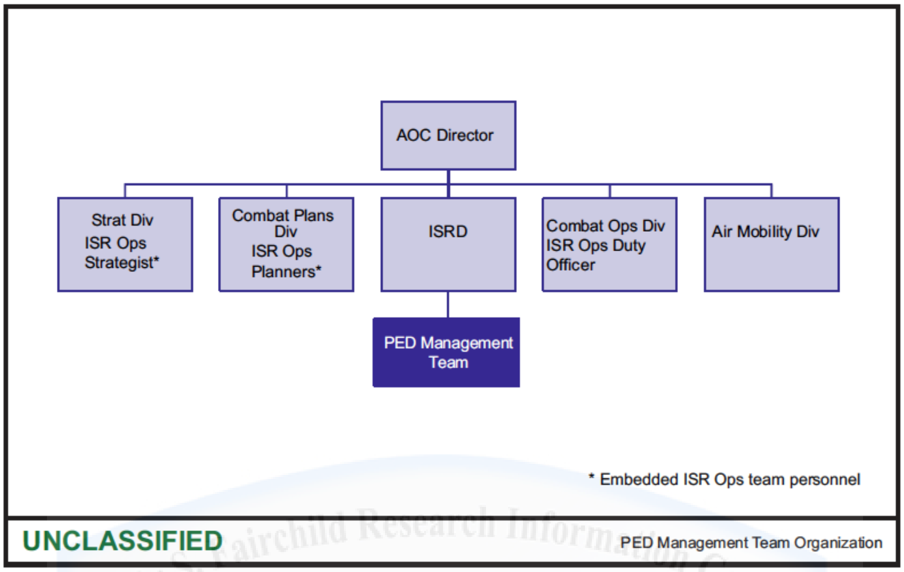


Transitioning between traditional and non-traditional ISR roles is a prime example of flexibility, a tenet of airpower the Air Force understandably embraces. As demands for ISR increased by approximately 3,000 percent over the last decade, the Air Force had to find ways to increase supply.[33] While this sends the Air Force on the path of achieving its goal of 65 combat air patrols (CAPs) by 2013, it does not necessarily embody flexibility.[34] The Air Force reacted to the additional CAPs with increased acquisitions of the MQ-1 and MQ-9. August of 2011 finally saw the full complement of 268 MQ-1s reached, with 79 of a planned 400 MQ-9s also acquired.[35] Increased demands for the persistent coverage that remotely piloted aircraft (RPA) offer caused the Air Force to become unnecessarily short-sighted. These aircraft, while filling an operational requirement, currently enjoy a threat-permissive environment and are not especially agile.

Unfortunately, the data NTISR collects is usually fleeting. The images and weapon system video (WSV) obtained from the aircraft is normally not included in processing, exploitation and dissemination (PED). It is used for that operation and then it is gone, unless incorporated into a larger requirement such as the location of improvised explosive devices (IEDs). Again, necessity drove invention with respect to a new method of reporting a specific piece of data following NTISR operations. This process was a result of the increased IED activity in both OIF and OEF and the inability of LD/HD ISR assets to fill the requirement. Named an EYELID report, it was something an aircraft conducting XCAS or NTISR provided the operations center either immediately or upon completion of its vulnerability period in Iraq or Afghanistan. It involved EO/IR capable aircraft scanning lines of communication (LOC) for suspicious activity or locations of IEDs. As with the Scud hunt during the early parts of OIF, EYELID reports were not very effective. Though initially a good concept, the effectiveness of finding IEDs with EO/IR capabilities fell short. It was a combination of the EO/IR capability itself, the high false alarm rate and the processes involved with PED. Duplication of effort was common because the data gleaned from EYELID reports rarely made it back to the aircrew supporting the mission, which increased the amount of similar information coming into the AOC.[36] The potential increases in data that NTISR provide leads to questions of PED because it requires potential personnel increases in order to accomplish this feat, not just a deconfliction of effort.

The larger amounts of data means nothing if there is not an equally large amount of personnel for PED. There was a 1500% increase in the volume of data associated with traditional ISR with a miniscule increase in the ability of PED since combat operations began in 2001.[37] The addition of data from NTISR could potentially overload the system, if it is deemed

worthy of analyzing. Currently there are multiple teams responsible for roughly the same product when it comes to PED, although the PED Management Team within the ISR Division (ISRD) is specifically assigned the task.[38]




**PED Management Team Organization**[39]



Duplication of effort does not help the Air Force toward its goal of becoming more efficient. The Air Force cannot afford to have a smaller force executing the same functions; something has to give.

Automation is one area the Air Force should investigate if it is to solve the problem of increased data bogging down the ability of PED. The current primary source of potential intelligence within NTISR involves IMINT, specifically static images and WSV. There is already plenty of data available from these sources that aid PED, such as coordinates (latitude, longitude and elevation), slant range, type of image (IR/TV), observed object type (building, individuals, etc.), orientation (relative to true north), and even relative size. Tagging, or embedding, this data into each image or video helps ease the organization of information and search process once it is posted onto a common database. This is similar to new processes

implemented within the RPA fleet for tagging FMV.[40] Once each image is tagged with the appropriate information and sent forward for potential PED, automation could take over to help analysts determine whether or not the data deserves further attention.[41]

Either a single database for submitting and distributing acquired ISR data in addition to a more powerful search engine is required. There are several opportunities to input the same data into various systems, increasing the likelihood for duplication of effort. The data obtained from NTISR assets should first use its unit intelligence personnel to imbed appropriate information before submitting it for further PED, such as the aforementioned data available from current targeting pods (coordinates, elevation, etc.). Key imbedded and searchable information will help determine whether that data is useful for further PED. There must be a streamlining of effort that also allows technology to work for the various users, not against them. If not, there is risk of suffering from the autonomy paradox, which essentially states that the systems designed to reduce the need for human operators will require more manpower to support them, much like the support structure required for each RPA CAP.[42]



Currently, both the National Geospatial-Intelligence Agency (NGA) and Director of National Intelligence (DNI) are working toward integration of data into a common cloud architecture.[43] This migration makes accessing the data more secure and faster, plus adds an additional benefit: mobility.[44] Within both the National Security Agency (NSA) and Department of Defense (DoD) are over seven million pieces of information technology (IT) infrastructure.[45] Moving this infrastructure to a cloud environment with common databases enables the intelligence community (IC) to achieve deeper analysis.[46] According to the National Reconnaissance Office (NRO) Director, "95% of GEOINT and 90% of SIGINT is at easily-accessible levels" for troops in the field.[47] Moving data gathered from both traditional and non-

traditional ISR assets to a cloud architecture has the potential to increase capability and streamline operations.

Technology can definitely assist the Air Force with its goal of becoming a more agile, flexible and ready force in lieu of looming manpower and budget cuts. With each RPA CAP requiring 120 personnel, this seems like a tall order, especially with the goal of attaining 65 CAPs by 2013.[48] Current Air Force priorities favor multi-role platforms over those with narrowly focused capabilities.[49] Interestingly, a large amount of its budget and effort is geared toward supporting platforms that will not deliver that multi-role capability for several years. These platforms, such as the F-35, long-range strike bomber and KC-46 tanker, still resemble those with traditional niche capabilities. In fact, the 2011 United States Air Force Posture statement gives the KC-46 takes top priority honors followed in second place by the F-35; ISR systems ranks third followed by the long-range strike system and space capabilities.[50] This makes the argument for a cheaper multi-role alternative that much more enticing to a fiscally constrained force.



Favoring multi-role capabilities and actually executing this plan are two separate things the Air Force must bring together. Though NTISR currently suffers from a lack in breadth of capability, it still provides a potential launching point for future multi-role ideas. The Sniper XR is a very capable system and is transferrable between different types of aircraft, adding not only a capability, but multiple roles. This same concept could be applied to an entirely new collection pod with additional capabilities (multispectral, hyperspectral, light detection and ranging (LIDAR), etc.) This collection pod requires standardization, similar to not only the Sniper XR, but also to how combat aircraft utilize common weapons. For instance, the guided bomb unit (GBU)-38, a 500 lb class weapon, is easily transferrable between different combat aircraft. The

lug spacing required to attach it to the aircraft is the same at 14 inches, with the addition of only a fuze and umbilical connecting to the aircraft. The only difference is how the GBU-38 reaches its target; the delivery method changes. The same is true for a possible collection pod, whether that delivery method is: low, high, fast, persistent, etc. However, developing such a pod would take additional commitment of time and money by the Air Force. It would definitely be time and money well spent, for a new collection pod would increase capability, provide additional flexibility and make the Air Force much more agile than it is in its current form.

Though the wisdom of investing time and money into a new system may seem fallible, it is quite the contrary. The Air Force's budget specifically protects science and technology funding.[51] Being agile, flexible and cost-effective is the way ahead, and a new collection pod will benefit the Air Force across all of these goals. The Air Force is already cutting 280 aircraft across a wide range of capabilities, such as the A-10, F-16, RQ-4 Block 30, E-8 and multiple airlift/tanker assets.[52] Personnel are also seeing reductions, with 9,900 Active, Guard and Reserve Airmen being cut based on a new force restructuring.[53] These are the first of many sacrificial lambs the Air Force must abandon in order to continue funding other programs, such as the F-35, MQ-9, modern radars, precision munitions and contributors to the new Air-Sea battle concept.[54] Adding a collection pod would not only help fill a capability that is currently LD/HD, but also provides a sensor that is well worth the investment for future conflicts.[55]

ISR assets will always be in high demand because information is what drives military decision making. Finding a commander that requests the least amount of information possible would be a difficult task in today's military. This is why the Air Force reacted to increasing ISR requests with a near-equal increase in assets that could support the mission and fill the requirement. Fortunately, there is a way ahead. An additional collection pod would not only

help augment the LD/HD assets in the current fight, but provide an undeniably beneficial capability to any current or future combatant commander, no matter what the area of responsibility (AOR). This collection pod should also be considered for air mobility command (AMC) aircraft, such as the C-130 and KC-135. Having a highly adaptable and modular force is the essence of flexibility. Instead of spending an enormous amount of money on aircraft with specific capabilities, the Air Force should focus on augmenting current aircraft with additional capabilities. This would help realign the Air Force to its goal of becoming more responsive, agile and cost-effective.

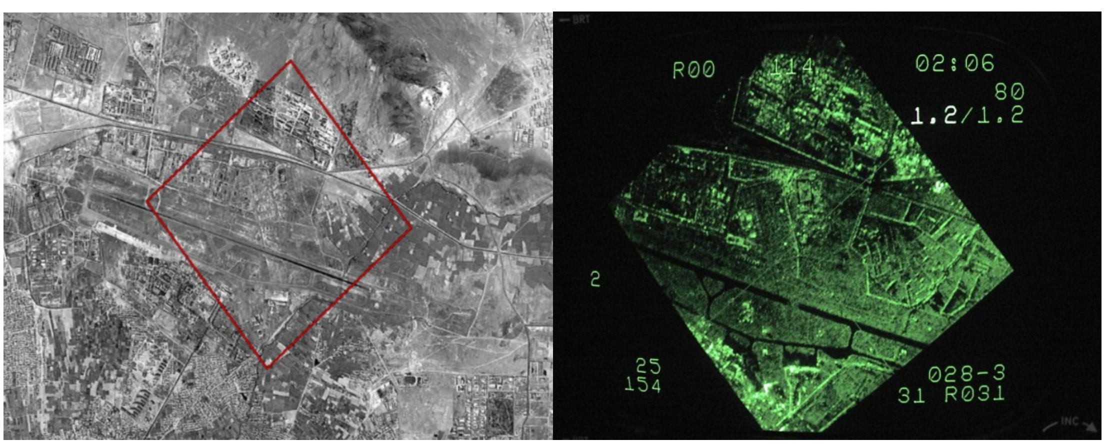
The additional capability an ISR pod brings to the current and future fight is more than worth stringent examination. For a quick cost comparison, integration of the Sniper XR on the B-1 cost the Air Force $193.9 million.[56] This cost was for the entire fleet and is well under the low-rate initial production (LRIP) batch cost of a single F-35, currently at $203.4 million.[57] This number will only increase in the short term, with estimates of the F-35C variant estimated at $235.8 million per aircraft.[58] Though these prices will likely decrease once the aircraft enters full-scale production in a few years, it is a prime example of how the Air Force could potentially refocus its monetary efforts to a new collection pod. Adding this collection pod to existing combat aircraft increases flexibility and agility not only in today's fight, but future fights as well.

The threat permissive environment currently enjoyed by ISR assets today cannot logically become a given for future operations. This will make the majority of RPAs incapable of delivering on their ISR mission, causing commanders to rely more on other sources for ISR, such as stand-off ISR from the RC-135, P-3, E-8 or U-2. Unfortunately, a non-permissive environment may preclude these high-value airborne assets (HVAA) from penetrating too deeply into contested airspace. This would cause a heavy reliance on ISR support from other means

such as satellites. Satellite assets may or may not be available or provide the necessary fidelity or even amount of information to the commander. A collection pod strapped to any strike asset (independent of service) would help to remedy this conundrum, provided it is a capability that is integrated in the same manner as the Sniper XR. However, the capability needs to be taken one step further.

Any type of targeting, sensor or jamming pod provides instant flexibility and modularity to supported airframes. It provides flexibility, much in the same manner that the Sniper XR augments onboard sensors. In a contested environment, the collection pod could act as an additional RWR to the host aircraft in addition to collecting specific information. This data could transfer via a link similar, yet separate, from something such as Link-16. The various pods would share information on this link and transfer this data to the aircraft (plus additional assets), such as SIGINT from one geographic area and COMINT from another. Cross cueing of these sensors could not only provide the host aircraft (or flight of aircraft) with additional threat information, but also the ability to rapidly target these enemy systems and significantly reduce the time involved with the find, fix, track, target, engage and assess (F2T2EA) kill chain.






**Example of cross-cueing various sensors to gain additional information; Kabul International Airfield, Afghanistan. (Left: satellite imagery Right: SAR from B-1)**

In addition to reducing the kill chain, a collection pod benefits both ISR planners and operations. Currently, there is a disparity between Air Force doctrine and the way it conducts ISR operations. Despite a January 2012 rewrite, AFDD 2-0 still separates ISR from the rest of Air Force operations. For example, the Air Force eliminated references to "in direct support of… operations" from its definition of ISR, something that the joint definition still includes.[59] Instead, the Air Force opted for a "global integrated ISR" posture, arguing it is a "cross-domain synchronization and integration of the planning and operation of ISR assets" and sensors.[60] There are several references to global and more traditional ISR platforms, such as the U-2, RQ-4 and MQ-9. However, the airman's perspective on global integrated ISR claims that it is "domain, service and platform neutral."[61] In fact, there is not a single reference to NTISR in the current publication. An integrated ISR pod would help bring the "in direct support of operations" piece back into the definition, providing a capability that is truly domain, service and platform neutral.

While the actual non-ISR asset may not be available for retasking, its sensor may be. This could be accomplished through various means: reprogramming, datalink, satellites, etc. Ownership of the actual platform is not necessary, which helps alleviate questions of ownership. Instead, the platform (A-10, F-16, B-52, etc.) acts as a sensor bus for the collection pod, gathering data as part of its originally planned mission or through dynamic tasking. For larger aircraft, such as the B-1, use of the extra external hardpoint allows it to carry not only the Sniper XR, but the additional collection pod. If this is not possible, the advantage of flying in formation (two-ship or more) allows use of both the Sniper XR and collection pod, depending on the configuration and aircraft loadout; this holds true for fighter aircraft as well. The added benefit

of the collection pod far outweighs the cost of removing one weapon from a fighter or a Sniper XR from a two-ship of bombers (where the loadout is not affected).

Integration into an established aircraft system provides a certain amount of control, but a predetermined amount of automation makes this capability more viable in a semi or non-permissive threat environment. Automating the collection pod precludes any added work for the aircrew, something that causes issues in a semi or non-permissive environment. If integrated with the aircraft systems, particularly the INS and GPS feed onboard all military aircraft, the collection pod could know its position at all times and be able to "sniff" for different types of information (ELINT, COMINT, etc.) at predetermined geographical points. It could also be fitted with a separate global positioning system (GPS) antenna that has selective availability anti-spoofing module (SAASM) abilities, similar to the currently used on equipped joint direct attack munitions (JDAM).



In addition to communicating between pods for real-time data, these collection pods could store information onboard for later processing. This would not only provide redundancy in between different collection pods, but provide a sound system of information distribution in case the pod link fails. Data storage onto the pod itself and downloading the data post-mission is an option. While this would not necessarily add to the current fight, it could prove beneficial for future operations later in the ATO cycle. Parametric data, location, emission times and other data could also be brought back and exploited through ground-based systems. This is not inconceivable considering the potential for contested electronic warfare (EW) environments.

While the concept of a new collection pod seems feasible but highly unrealistic, it deserves consideration for integration in today's Air Force arsenal. NTISR, through use of externally mounted pods such as the Sniper XR, is a proven combat capability. However, it is

often overlooked because it does not deliver the same level of effects that traditional ISR assets provide. Bridging these gaps through a modular sensor with potential link and data storage/transfer capabilities helps solve the issues of narrow capabilities and fleeting data. Organization and ownership issues begin to dissolve because a collection pod redefines what non-traditional assets bring to the ISR fight, providing the potential to collect additional data not normally associated with a traditional strike asset. Becoming a more agile and flexible Air Force in the wake of looming budget cuts depends on creative use of our decreasing platform and personnel strength. If the Air Force is serious in pursuing true multi-role capabilities and sacrificing niche ones, it must consider options that further its ability to conduct operations not only in the current fight and with current platforms, but future fights as well.

[1] Air Force Priorities for a New Strategy with Constrained Budgets. (2012, February), 2.
[2] Ibid., 2.
[3] Active Duty Military Personnel, 1940-2011. Retrieved March 22 2012, from Info Please: http://www.infoplease.com/ipa/A0004598.html
[4] The term platform is not exclusive to aircraft, but is focused primarily on those that support operations (aircraft, satellites, operations centers, etc.).
[5] SECAF Michael Donley. SECAF ISR Review Task Prioritization. *ISR Review Task Memorandum* (Washington: USAF).
[6] Ibid.
[7] Ibid. Other commands supported include Air Force Special Operations Command (AFSOC), United States Air Forces Europe (USAFE), Pacific Air Command Air Forces (PACAF), Air Mobility Command (AMC), Air Force Material Command (AFMC) and Air Force Reserve Command (AFRC).
[8] Ibid.
[9] Lt Col Lewis Hill. *An Airman's View of NTISR*. ALSA 2007-3, 5.
[10] W. Rosenau. *Special Operations Forces and Elusive Enemy Ground Targets.* (Arlington: RAND), 33-34
[11] Ibid., 40-42.
[12] ACC/PA. *LANTIRN*. Retrieved February 22, 2012, from The Official Website of the United States Air Force.
[13] Northrop Grumman. *AN/AAQ-28(V) LITENING Targeting Pod*. Retrieved February 22, 2012, from Northrop Grumman: http://www.es.northropgrumman.com/solutions/litening/
[14] Ibid.
[15] Sniper XR uses image-processing algorithms to enhance displayed images. The XR (extended range) feature of the Sniper XR digitally combines four magnified frames around the crosshairs to enhance the image, but can be influenced by range to the viewed target as well as relative motion.
[16] Sniper XR Capabilities Brief (2008).
[17] According to AFDD 2-0, IMINT "involves the collection and analysis of images that are recorded and stored."
[18] This is based on personal experience.
[19] Actual accuracies derived from the targeting pod are classified. For more information, visit the 561st Joint Tactics Squadron website on SIPRNET: http://www.nellis.af.smil.mil/units/561jts/
[20] AFTTP 3-3.AOC (12 March 2012). *Operational Employment Air Operations Center*, 6-100.
[21] Lt Col Lewis Hill. *An Airman's View of NTISR*. ALSA 2007-3, 6.
[22] Lt Col Clint Hinote. *Centralized Control and Decentralized Execution: A Catchphrase in Crisis?*. AFRI Papers 2009-1, 41.
[23] Ibid., 41.
[24] Ibid., 41.
[25] AFTTP 3-3.AOC, 4-44. While I have planned and flown a plethora of missions, I have never actually seen this spreadsheet.
[26] Ibid., 4-42.
[27] A TIC situation is the highest priority mission at a given time. Strike assets can get pulled from relatively high priority JTARs to support a TIC because friendly troops are in direct contact

with the enemy. While these situations do not always require the need for a kinetic option, it is a possibility.
[28] 505th Operations Squadron Joint Integration Team (JIT) (29 Apr 11). *Step-by-Step Guide to Filling out Combined Forces Air Component Commander (CFACC) ISR Request Form*.
[29] Picture taken and modified from http://www.zone-five.net/showthread.php?p=204198
[30] While several missions were labeled as NTISR on the Mission Analysis Tool (MAT) at the AOC, they were usually labeled that after an aircraft conducting XCAS was re-roled to NTISR.
[31] Lt Col Lewis Hill. *An Airman's View of NTISR*. ALSA 2007-3, 5.
[32] While the MQ-9 does carry both AGM-114 and GBU-12, its loadout is significantly smaller than even the smallest strike aircraft.
[33] M. Schanz. The New Normal for RPAs. *AIR FORCE Magazine*, 52
[34] Amy McCullough (2011*). Remotely Piloted Aircraft Fleet Nears Combat Milestone*. Airforce-magazine.com
[35] Ibid., 52.
[36] I personally flew several missions in OEF where the same data was reported several times to a specific Army or Marine unit without ever making it to the aircrew. Therefore, we duplicated our efforts quite often when conducting XCAS or NTISR in support of ground units. Often the same LOC would be scanned with the same potential IED locations gathered by different aircrew on different ATO days.
[37] T. Costlow (2011). Put STRATCOM In Charge of All GEOINT PED: Gen. Kehler. *Defense Systems*, 44.
[38] Other teams involved include the imagery support element (ISE), PED LNOs, ISR operations duty officers (ISRODO), SIDO, ISRD, specific platform LNOs and other PED nodes.
[39] AFTTP 3-3.AOC, 6-120.
[40] M. Schanz (2011). The New Normal for RPAs. *AIR FORCE Magazine*, 53.
[41] T. Costlow, Put STRATCOM In Charge of All GEOINT PED: Gen. Kehler, 44.
[42] J.L. Blackhurst, et al. (2011). The Autonomy Paradox. *Armed Forces Journal*, 21.
[43] Defense Systems Staff. (2011, November). GEOINT Community Hammers Out Integration Strategies. *Defesne Systems: Knowledge Technologies and Net-Enabled Warfare*, 14.
[44] Ibid., 14.
[45] Ibid., 14.
[46] Ibid., 14.
[47] Ibid., 14.
[48] D. Fulghum,(2010). *Afghan War Demands Flexible Weaponry.* Aviation Week.
[49] Air Force Priorities for a New Strategy with Constrained Budgets. (2012, February), 3.
[50] Department Of the Air Force. (2011). *Fiscal Year 2012 Air Force Posture Statement*, 1.
[51] Air Force Priorities for a New Strategy with Constrained Budgets. (2012, February), 4.
[52] Ibid., 3.
[53] Ibid., 4.
[54] Ibid., 4.
[55] This pod would not include integration on "stealth" aircraft for obvious reasons.
[56] Michael Hall (2012 Feb 6). SNIPER Total Cost. Tinker AFB, OK.
[57] Giovanni de Briganti (2012). Analysis: F-35 LRIP 5 Contracts: Unit Cost Tops $200M for First Time. Defense-aerospace.com (http://www.defense-aerospace.com/article-

view/feature/133433/f_35-unit-cost-tops-$200m--%3Ci%3E(updated)%3C§i%3E.html). The LRIP 5 batch consists of 30 aircraft.

[58] Ibid.

[59] Air Force Doctrine Document (AFDD) 2-0. *Global Integrated Intelligence, Surveillance, & Reconnaissance Operations*, 1.

[60] Ibid, 1.

[61] Ibid, 3.

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